ENVIRONMENTALLY SENSITIVE AREAS STUDY: COUNTY OF LEDUC

Edmonton Metropolitan
Regional Planning Commission

Volume I - Executive Summary

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Executive Summary

INTRODUCTION

Interest in setting aside or protecting natural landscapes and unique natural or cultural features has increased in Canada in recent years as public and government agencies become increasingly aware of the possible environmental consequences of expanding human settlement and resource development. In heavily settled or developed regions, natural landscapes have been dramatically altered and in some regions, important natural landscapes have disappeared entirely. These concerns are perhaps most acute in the vicinity of major urban centres where expanding residential and industrial developments threaten environmentally sensitive or significant areas.

In response to these concerns, the County of Leduc requested that the Edmonton Metropolitan Regional Planning Commission conduct an inventory of environmentally sensitive areas in the county and to identify management requirements for retaining or protecting these sites. The resulting study was conducted by D.A. Westworth & Associates Ltd. during 1989-90.

Objectives

The overall objective of the study was to conduct an inventory and evaluation of environmentally sensitive and significant areas on public and privately-owned lands within the County of Leduc. The inventory will provide the basis for formulating land use planning principles that will assist the Edmonton Metropolitan Regional Planning Commission and the County of Leduc in future planning and environmental management in the region. Specific objectives of the study were to:

- Evaluate and classify the relative sensitivity and the significance of these areas as to their local, regional, provincial, national and international importance.
- Formulate appropriate land use planning principles for environmentally sensitive and significant areas which may be used to guide future planning and development in the County of Leduc.

- Refine, where necessary, the existing policies in Section 7.0 of the Edmonton Metropolitan Regional Plan, which deals with environmentally sensitive areas. Although the study was commissioned by the Edmonton Metropolitan Regional Plannning Commission, the western portion of the County of Leduc lies within the Battle River Regional Planning Commission. Therefore, suggestions to refine the Battle River Regional Plan have also been included.

CLASSIFICATION CRITERIA AND LEVEL OF SIGNIFICANCE

Each of the sites or areas identified as environmentally sensitive were evaluated for significance on a local, regional, provincial, national, or international level using the following 10 components of the natural environment as identified in Section III of the Terms of Reference:

1. Hazard lands and areas which are unsuitable for development in their natural state (eg. floodplains, steep and unstable slopes).

2. Areas which perform a vital environmental, ecological or hydrological function (eg. aquifer recharge of groundwater storage areas).

3. Areas which contain unique geological or physiographic features.

4. Areas, buildings or features which are important for cultural, historical, prehistoric or archaeological reasons.

5. Areas which contain significant, rare or endangered species.

6. Areas which are unique habitats with limited representation in the region or areas that represent small remnants of previously abundant habitat which have virtually disappeared.

7. Areas which contain an unusual diversity of plant and/or animal communities due to a variety of geomorphological features and microclimatic effects.

8. Areas which contain large and relatively undisturbed habitats and provide sheltered habitats for species which are intolerant of human disturbance.

9. Areas which contain plants, animals or landforms which are unusual or are of local, regional, provincial, national or international significance.

10. Areas which provide an important linking function and permit the movement of wildlife over considerable distances.

ENVIRONMENTAL SETTING

The County of Leduc is located immediately south of the City of Edmonton, occupying an area of approximately 2,709 km^2. In 1989, the County of Leduc had a total population (rural and urban areas) of 35,641 people. The North Saskatchewan River is the major watercourse in the region and forms a portion of the north boundary of the county. A number of small creeks are also present, all of which drain north into the North Saskatchewan River. The county includes the northern portion of Pigeon Lake, the largest waterbody in the region. The county also includes a portion of Ministik Lake along with Wizard Lake, Looking Back Lake, Big Hay Lake and Coyote Lake.

Ecologically, the County of Leduc encompasses two of the 12 major ecoregions in Alberta, including the Aspen Parkland, and Boreal Mixedwood Ecoregions (Strong and Leggat 1981). Most of the county is comprised of the Aspen Subregion of the Aspen Parkland Ecoregion, however, inclusions of the Moist Mixedwood Subregion of the Boreal Mixedwood Ecoregion are also present in the northeast and west-central portions of the county. The County of Leduc contains a variety of landscapes that form a broad transition zone from the aspen-dominated communities in the east to mixedwood and conifer-dominated communities in the west.

The principal land use in the county is agriculture, particularly in the eastern and west central portions of the county. Other land uses in the county include oil and gas extraction, hunting and fishing and other forms of recreational activity. Because of the proximity to such major urban centres as the cities of Edmonton and Leduc, many lakes in the county have been exposed to high density cottage development. The Edmonton International Airport, Nisku Industrial Area and several country residential developments are also located within the county.

FISH AND WILDLIFE RESOURCES

The distribution of naturally occurring sportfish populations in the County of Leduc is limited. The North Saskatchewan River, which is known to support resident populations of northern pike, walleye, sauger, sturgeon, burbot and

suckers, along with migratory summer populations of goldeye, is considered to have good fisheries potential. No fisheries information is available for the smaller creeks in the county; however, low flows and low winter oxygen levels likely restrict the fisheries potential of the upper reaches of these streams.

There are also very few lakes in the county that are capable of supporting sportfish populations. Only 4 of the 50 lakes recorded by the Alberta Fish and Wildlife Division for the County of Leduc are known to support sport fish, with three of these constituting stocked populations. The most significant fishery is Pigeon Lake, which supports natural populations of northern pike, lake whitefish, walleye, yellow perch, burbot and white suckers. Other lakes containing sportfish include Wizard Lake, Coal Lake, and Leduc Reservoir which is stocked with rainbow trout.

The County of Leduc contains a diverse assemblage of wildlife species, however the distribution of wildlife in the county reflects the predominantly agricultural land use and the fragmented nature of remaining blocks of natural habitat. Habitat that does remain is typically associated with marginal agricultural lands. These areas include the steeply sloping lands associated with the North Saskatchewan River valley, incised valleys of several of the smaller creeks in the county, and several of the glacial meltwater channels, as well as some of the morainal landscapes in the eastern and western portions of the county where agricultural development has been limited by poor drainage and lower soil fertility.

Data on wildlife are available for only a few locations in the county. Most of the research that has been conducted has focused on the Cooking Lake Moraine, reflecting the importance of this landscape as a production and staging area for migratory birds. Forested portions of the Cooking Lake moraine also support moderately high densities of white-tailed deer, along with smaller numbers of moose, elk and mule deer.

White-tailed deer, mule deer, moose and elk are also associated with the larger forested blocks in the western part of the county. Of these, the most abundant species is the white-tailed deer. Studies conducted in the county have shown that

while white-tailed deer are dispersed throughout the area in early winter, there is a pronounced shift toward the North Saskatchewan River valley in late winter. Mixedwood stands containing mature white-spruce, that are associated with the river valley and the lower portions of tributary valleys, represent important winter habitat areas for this species. Concentrations of mule deer are associated with riparian forest and floodplain shrub communities along the North Saskatchewan River. A particularly high diversity of wildlife has been recorded in the Coyote Lake area where diverse and complex terrestrial and wetland habitats support at least 21 species of mammals, 70 species of birds, and 3 species of amphibians.

CULTURAL AND HISTORIC FEATURES

The Archaeological Survey of Alberta, Alberta Culture and Multiculturalism, maintains a current listing of archaeological sites throughout Alberta. A search of this information base revealed that approximately 200 archaeological sites have been located and described within the County of Leduc, many of which are associated with streams, rivers, lakes and other wetlands and with areas of ecological or topographic diversity. While the specific archaeological sites are too numerous to list, certain lands within the county are considered to have a high potential for the discovery of additional sites. These lands are typically associated with glacial features such as meltwater channels and glacial lakeshores or the Cooking Lake Moraine in the eastern portion of the county.

Fossil finds of regional, provincial, national or international significance are relatively uncommon in the central Parkland region. However, the Archaeological Survey of Alberta periodically provides an updated palaeontological sensitivity map for the province. Sensitivity zones are based upon the interrelationships between recorded site occurrences, fossiliferous formation outcrops, physiographic and hydrographic features and natural resource distribution. In the case of the County of Leduc, four sensitivity zones are found in the northwest and north-central portions of the county. The high sensitivity zone is associated with the fossiliferous bedrock outcrops found along the North Saskatchewan River valley. This zone contains the Genesee Natural Area, a site known for its 60-65

million year old fossil bed that dates back to the late Cretaceous and early Palaeocene periods.

The Alberta Historical Resources Act provides the mechanism for designating historic sites of provincial importance in Alberta. In the County of Leduc, only one Provincial Historic Resource (Leduc Oilwell No. 1) and one registered Historic Resource (Westlund House) have been designated.

ENVIRONMENTALLY SENSITIVE AREAS

Thirty-one environmentally sensitive areas comprising one international, five provincial, 11 regional and 14 locally significant sites were identified within the County of Leduc (Table 1). Of the thirty-one sites, 15 are located in the western third of the county (i.e. Conjuring Creek and west) (Figure 1). This region contains a large proportion of the remaining forested lands in the county. Environmentally sensitive areas in the remaining, predominantly cultivated areas of the county, represent remnant forested areas and relatively productive wetland sites and creeks.

MANAGEMENT CONSIDERATIONS AND RECOMMENDATIONS

The County of Leduc faces development pressures and planning requirements that come with being a highly productive agricultural area in close proximity to a large and expanding urban centre. Significant examples of natural landscapes still exist in the county, but for the most part, these areas are associated with marginal agricultural lands. Development and subdivision pressures on these marginal lands and on good or prime agricultural lands presents a double-edged problem.

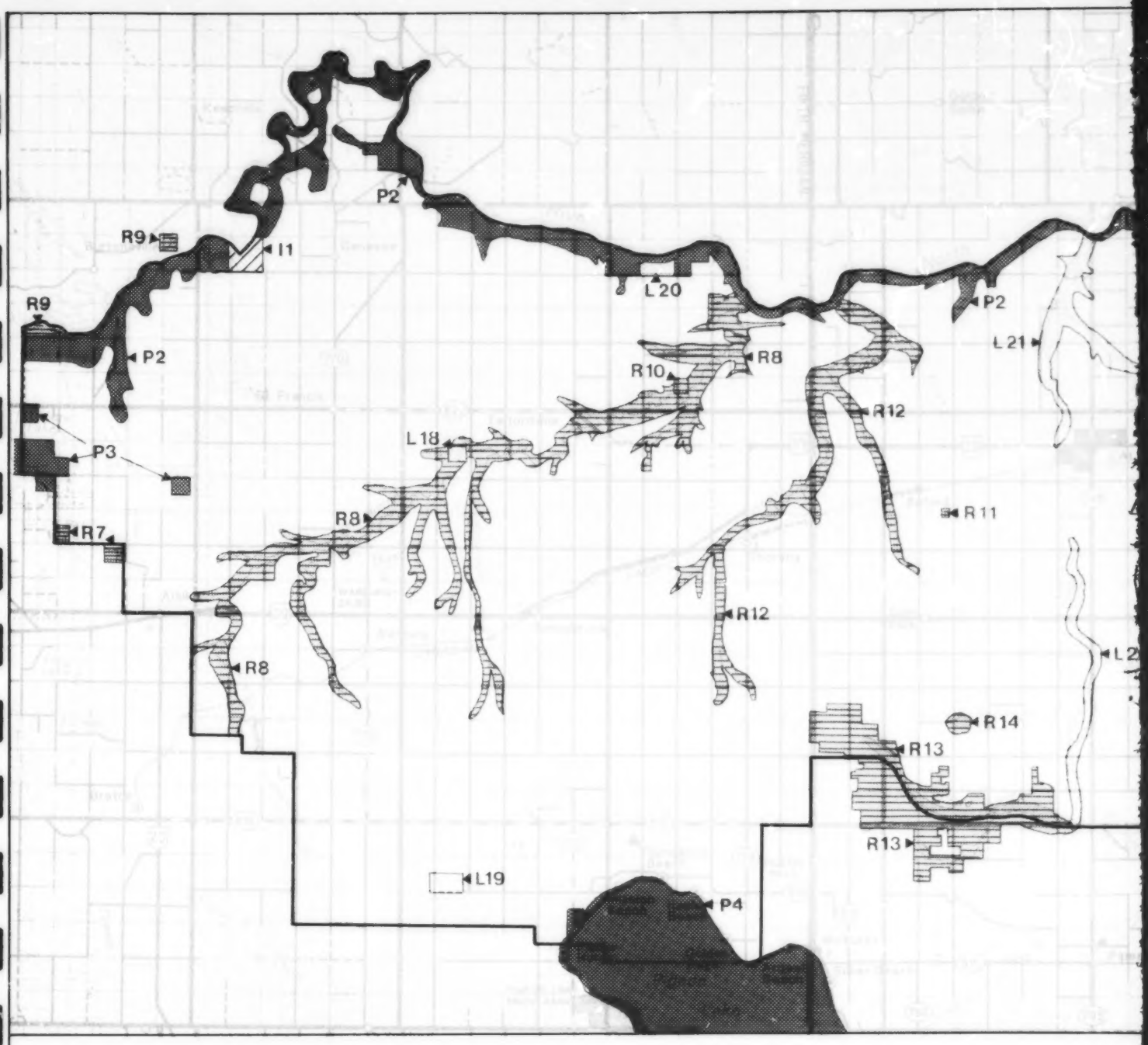
Conversion of prime agricultural land to non-agricultural uses results in increasing dependence on a reduced agricultural land base, which must be farmed more intensively to meet the increasing demand for food. Intensively cultivated lands often face problems of soil degradation, which further decreases the amount of land capable of long-term sustained food production and increases the pressure to bring marginal lands into production. Policies are therefore required at the municipal

Table 1. Summary of environmentally sensitive areas in the County of Leduc, 1989-90.

Site Name	ESA No.	Significant Features	Significance Level	Sensitivity Rating
Genesee Natural Area	I1	• Important palaeontological site	International	High
North Saskatchewan River Valley	P2	• Important watercourse • Relatively undisturbed riparian habitats • Key wildlife area	Provincial	Moderate
Coyote Lake Natural Area	P3	• Rare plant species • Rare bird species • Diverse aquatic/terrestrial vegetation communities • Important ungulate habitat	Provincial	High
Pigeon Lake	P4	• Important sport/commercial fishery • Sensitive Great Blue Heron Colony • Relatively undisturbed remnant parkland habitat	Provincial	Moderate - High
Leduc Oilwell No. 1	P5	• Designated provincial historic resource	Provincial	Low
Ministik Lake and Area	P6	• Interesting geological feature • Relatively undisturbed parkland habitat • Key wildlife area • Important waterfowl production area • Important Tundra Swan staging area	Provincial	Moderate - High
Alsike-Bat Lake Natural Area	R7	• Aquatic research and nature education potential • Waterfowl production area • Diverse breeding bird community	Regional	Moderate
Strawberry Creek	R8	• Key ungulate habitat • Diverse riparian habitats	Regional	Moderate
St. Francis Natural Area	R9	• Interesting hydrogeological features • Diverse breeding bird community	Regional	Moderate
Thorsby Natural Area	R10	• Relatively undisturbed parkland and riparian habitats • Diverse wildlife and vegetation communities	Regional	Moderate
Westlund House	R11	• Registered historical resource • Interesting architectural and historical background	Regional	Moderate
Weed Creek	R12	• Key wildlife area and travel corridor • Diverse vegetation communities	Regional	High

Table 1. .....Continued

Site Name	ESA No.	Significant Features	Significance Level	Sensitivity Rating
Wizard Lake	R13	• Important regional sport fishery • Important wildlife habitat • Grebe nesting area	Regional	High
Bucking Horse Lake	R14	• Important waterfowl production area	Regional	Moderate
Gwynne Channel	R15	• Interesting geological and archaeological features • Important wildlife habitats • Important regional sport fishery	Regional	High
Cawes Lake	R16	• Important waterfowl production area	Regional	Moderate
Big Hay Lake	R17	• Important waterfowl breeding and staging area • Diverse aquatic and vegetation communities	Regional	Moderate
Telfordville Natural Area	L18	• Diverse upland and riparian habitats	Local	Moderate
Strawberry Creek Natural Area	L19	• Undisturbed aspen parkland • Wildlife habitat values	Local	Moderate
East Genesee	L20	• Old burn area • Diverse upland habitats	Local	Moderate
Conjuring Creek	L21	• Remnant wildlife habitat	Local	Moderate
Old Bendick Property	L22	• Rare introduced plant species • Historically interesting	Local	Moderate
Rollyview Marsh	L23	• Waterfowl breeding and staging area	Local	Moderate
Rollyview Wetland-Pothole Complex	L24	• Topographically interesting area • Diverse aquatic and terrestrial habitats • Great Blue Heron foraging area	Local	Moderate
Pita Marsh	L25	• Waterfowl staging area	Local	Moderate
Devon Ravine East	L26	• Nature education value • Ungulate over-wintering area	Local	Moderate
Oriole Marsh	L27	• Waterfowl breeding and staging area	Local	Moderate
Steer Marsh	L28	• Waterfowl breeding and staging area	Local	Moderate
Looking Back Lake	L29	• Waterfowl breeding and staging area	Local	Moderate
Donnan Lake	L30	• Wildlife viewing area • Waterfowl production and molting area	Local	Moderate
Telford Lake	L31	• Waterfowl production area	Local	Low



LEGEND

INTERNATIONAL

I1

PROVINCIAL

P2	P5
P3	P6
P4	

REGIONAL

R7	R10	R13	R16
R8	R11	R14	R17
R9	R12	R15	

LOCAL

L18	L21	L24	L27	L30
L19	L22	L25	L28	L31
L20	L23	L26	L29	

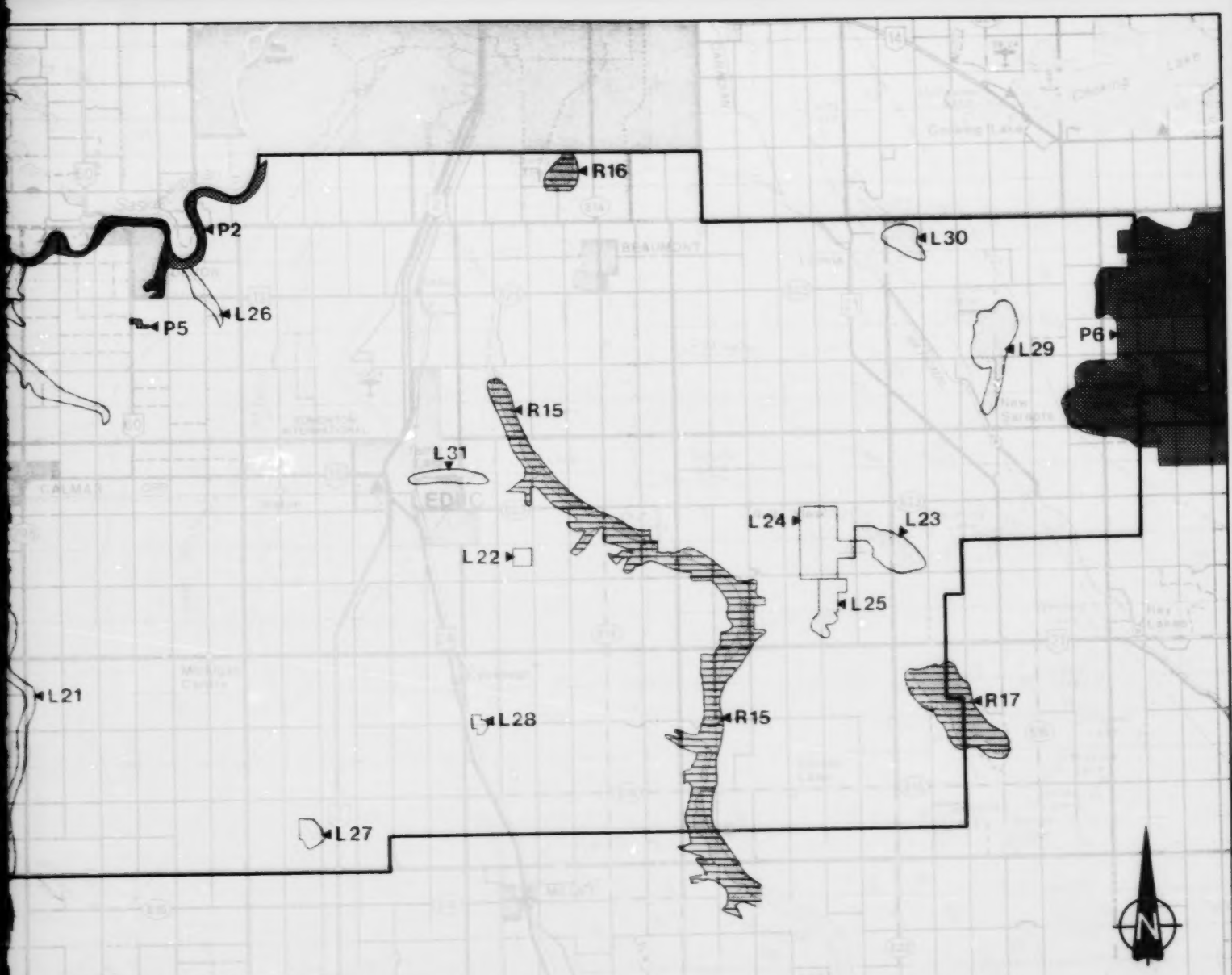


Figure 4. Distribution of environmentally sensitive areas in the County of Leduc, 1989-90.

L30
L31

level, as well as the provincial level, to deal with conservation of prime agricultural lands, development of marginal agricultural lands, and protection of significant natural features.

The problem is compounded by the fact that most of the remaining environmentally sensitive areas are on privately owned land. As well, the existing taxation system and certain provincial government programs do not favour the retention of environmentally sensitive areas, encouraging the conversion of these lands for agricultural uses.

Land use planning and development in the County of Leduc, as in other municipalities in Alberta, is directed by several important legislative Acts and statutory documents. Protection of environmentally sensitive areas can be addressed in the Regional Plan, General Municipal Plan, Lake Management Plans, Area Structure Plans and the Land Use Bylaw. This, however, would require a number of amendments to these plans and bylaws including:

A. Regional Plan

- Recognition of environmentally sensitive areas within the region and the need to consider environmental sensitivity within the context of planned land uses.
- Consideration of identified hazard lands as non-developable lands.
- Requirement for an environmental impact assessment for major recreational, industrial, commercial and residential developments.

B. General Municipal Plan

- Recognition of environmentally sensitive areas.
- Identification of compatible uses within environmentally sensitive areas for various types of development proposals.
- Protection of prime agricultural land by limiting subdivisions and non-agricultural developments.
- Restrictions on locating high impact developments adjacent to shorelines or groundwater recharge areas.

- Acquisition of environmentally sensitive areas through the provision of Environmental Reserves or Municipal Reserves in the subdivision process.
- Improved communication between the municipality and Alberta Culture and Multiculturalism regarding potentially important archaeological, palaeontological and historic sites, particularly when building and subdivision permits are issued.

C. Land Use Bylaw

- Definition of environmentally sensitive areas, environmental impact assessments and developable areas to reflect the intent shown in the General Municipal Plan.

Other initiatives are also required to maintain the diversity of natural habitats and fish and wildlife species remaining in the county. Loss of natural vegetation cover is proceeding at an unprecedented rate, as landowners attempt to bring land that was previously considered marginal into agricultural production. These trends are resulting in reduced abundance of most wildlife species, and some of the more wide-ranging species can be expected to disappear entirely over the next 30 years.

Recognition and management of environmentally significant areas will help to alleviate this problem, since many of the sites identified were selected on the basis of their value as wildlife nesting areas, travel corridors, or winter ranges. The problem however, is much broader than this. The criteria that are used in selecting environmentally sensitive areas, even when sites are identified at a local level of significance, fail to include a large proportion of the productive wildlife habitat in the county. Furthermore, the problem is compounded by the fact that a majority of the habitat remaining in the county, including many of the habitat areas that were identified as environmentally sensitive areas, is on privately owned land.

A number of initiatives were recommended to deal with this serious problem of habitat loss on private lands. These include:

- Development of a comprehensive habitat management strategy for the County of Leduc, which should establish priorities for habitat management based on the value or importance of particular habitat areas and their vulnerability.

- Programs or mechanisms should be implemented to achieve goals established under the habitat management strategy. The preferred alternative would be to support a bundle of management options that would offer different degrees of protection depending on the priority identified for particular habitat areas.
- Participation and active support of existing provincial programs including the Fish and Wildlife Division's Landowner Habitat Program, the Alberta Fish and Game Association's Habitat Steward Program and the North American Waterfowl Management Plan. Other programs include Alberta Agriculture's Shelterbelt Program and the Permanent Cover Program.
- Because of the clear lack of information, fish and wildlife inventories directed towards non-game species should be initiated in environmentally sensitive areas of the county that have potential as wildlife viewing and nature interpretation sites.

Environmentally sensitive areas identified in the County of Leduc typically represent remnant habitats and in some cases, relatively undisturbed natural areas. However, continuing habitat loss in the county is a complex problem involving agricultural, economic, political, social and biological factors. Because of this complexity, a coordinated effort on the part of the county, regional planning commissions, fish and wildlife and agricultural managers, fish and game clubs, naturalists and the general public is required. One step in this process would be the implementation of the study's recommendations which can be used as a basis for formulating current and future land use management strategies for the County of Leduc.